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EXAMINER
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HSU, JONI

ART UNIT	PAPER NUMBER
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2671

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Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/646,076	<b>Applicant(s)</b> MONTRYM ET AL.	
	<b>Examiner</b> Joni Hsu	<b>Art Unit</b> 2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

By

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 2 is objected to because of the following informalities: Claim 2 ends with a colon (:) where it should end with a period. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 23 and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 23 and 24 recite the limitation "the predefined memory range". There is insufficient antecedent basis for this limitation in the claims.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international

Art Unit: 2671

application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 28-32 and 35 are rejected under 35 U.S.C. 102(e) as being anticipated by van Vugt (US006833835B1).

6. With regard to Claim 28, van Vugt describes a method for reading a frame buffer (*retrieving from the memory an existing colour value of the physical pixel*, Col. 2, lines 4-10), the method comprising receiving an address corresponding to a pixel (*memory address within a given frame-buffer of the physical pixel corresponding to the reference pixel is calculated*, Col. 3, lines 28-40). Van Vugt describes rasterizing input pixel data as virtual pixels into a memory with a virtual resolution that is higher than the physically displayed pixel resolution (Col. 1, line 66-Col. 2, line 4). The image is being rasterized in subpixels smaller than the display pixels, therewith achieving a higher resolution than the display resolution (Col. 1, lines 46-50). Therefore, van Vugt describes transforming the received address into at least one subpixel address; reading at least one subpixel from the frame buffer using at least one subpixel address (*memory address within a given frame-buffer of the physical pixel corresponding to the virtual pixel is calculated, parameters in the calculation include the frame-buffer start address, the factor by which the virtual resolution is greater than the normal resolution*, Col. 3, lines 28-45), wherein the frame buffer is a single memory comprising a plurality of pixels (Col. 3, lines 28-30), wherein each pixel comprises a plurality of subpixels; and blending the at least one subpixel

to create a pixel value (*combining the colour values of the subpixels included in the corresponding display pixel*, Col. 1, lines 50-57).

7. With regard to Claim 29, Claim 29 is similar in scope to Claim 28, except that Claim 29 has the extra step of supplying the created pixel value. Van Vugt describes supplying the created pixel value as if it were a pixel value at the received address (*the system linearly combines per each colour component the existing and the input colour value and by using the result thereof to overwrite the existing colour value of the physical pixel at the memory location of the physical pixel*, Col. 2, lines 10-14). Therefore, Claim 29 is rejected under the same rationale as Claim 28.

8. With regard to Claim 30, van Vugt describes a method for writing a frame buffer (*overwrite the existing colour value of the physical pixel at the memory location*, Col. 2, lines 10-14) comprising receiving an address and a pixel value from a computer program (*software program, memory address within a given frame-buffer of the physical pixel corresponding to the reference pixel is calculated, retrieve the value of the physical pixel*, Col. 3, lines 24-45). Van Vugt describes rasterizing input pixel data as virtual pixels into a memory with a virtual resolution that is higher than the physically displayed pixel resolution (Col. 1, line 66-Col. 2, line 4). The image is being rasterized in subpixels smaller than the display pixels, therewith achieving a higher resolution than the display resolution (Col. 1, lines 46-50). Since the subpixels are virtual, the computer program supplies the address and pixel value as if accessing a frame buffer that does not comprise subpixels. Van Vugt describes transforming the received address into at least one subpixel address; writing the pixel value to a frame buffer as at least two

Art Unit: 2671

subpixel values using the at least one subpixel address wherein the frame buffer is a single memory comprising a plurality of pixels (*memory address within a given frame-buffer of the physical pixel corresponding to the virtual pixel is calculated, parameters in the calculation include the frame-buffer start address, the factor by which the virtual resolution is greater than the normal resolution (e.g. 1, 2 or 4)*, Col. 3, lines 28-45; *overwrite the existing colour value of the physical pixel at the memory location*, Col. 2, lines 10-14) wherein each pixel comprises a plurality of subpixels (*subpixels included in the corresponding display pixel*, Col. 1, lines 50-57).

9. With regard to Claim 31, Claim 31 is similar in scope to Claim 29, except Claim 31 supplies the read subpixel value. Van Vugt describes supplying the read subpixel value as if it were a pixel value at the received address (Col. 2, lines 10-14). Therefore, Claim 31 is rejected under the same rationale as Claim 29.

10. With regard to Claim 32, van Vugt describes a method for supplying a virtual frame buffer to a computer program, comprising supplying a base address and buffer size information to the computer program, the base address and the buffer size information corresponding to a virtual frame buffer; receiving an address in the virtual frame buffer from the computer program; transforming the received address into a least one subpixel address, the subpixel address being an address into a frame buffer which is a single memory storing data of a plurality of subpixels corresponding to each pixel of the virtual frame buffer; reading at least two subpixels from the frame buffer using the subpixel address (*software program, storage of data of a virtual pixel, memory address within a given frame-buffer of the physical pixel corresponding to the virtual*

*pixel is calculated, parameters in the calculation include memory width, frame-buffer start address, the factor by which the virtual resolution is greater than the normal resolution (e.g. 1, 2 or 4), retrieve at the calculated memory address the value of the physical pixel, Col. 3, lines 24-45).* Van Vugt describes rasterizing input pixel data as virtual pixels into a memory with a virtual resolution that is higher than the physically displayed pixel resolution (Col. 1, line 66-Col. 2, line 4). The image is being rasterized in subpixels smaller than the display pixels, therewith achieving a higher resolution than the display resolution (Col. 1, lines 46-50). Van Vugt describes blending the at least two subpixels to create a pixel value; supplying the created pixel value to the computer program as if it were a pixel value located at the received address in the virtual frame buffer (*retrieving from the memory an existing colour value of the physical pixel that corresponds to a virtual pixel, the system linearly combines per each colour component the existing and the input colour value and by using the result thereof to overwrite the existing colour value of the physical pixel at the memory of the physical pixel, Col. 2, lines 10-14).* Since the computer program is retrieving the value of the physical pixel using the virtual coordinate (Col. 3, lines 41-45), the computer program does not directly access the frame buffer.

11. With regard to Claim 35, van Vugt describes that the computer program is an application program (software program, Col. 3, lines 24-28).

12. Thus, it reasonably appears that van Vugt describes or discloses every element of Claims 28-32 and 35 and therefore anticipates the claims subject.

*Claim Rejections - 35 USC § 103*

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

15. Claims 1-4, 9, 10, 13, 15-17, 19, 21, 22, 24, 26, 33, and 34 rejected under 35 U.S.C. 103(a) as being unpatentable over van Vugt (US006833835B1) in view of Porterfield (US006249853B1).

16. With regard to Claim 1, van Vugt describes a method for providing antialiased memory access, comprising receiving a request to access a memory address; and transforming the memory address into at least one physical address within a frame buffer utilized for antialiasing (*antialiased imaging, retrieving from the memory an existing colour value of the physical pixel that corresponds to a virtual pixel*, Col. 1, line 60-Col. 2, line 14; *memory address within a given*



*frame-buffer of the physical pixel corresponding to the virtual pixel is calculated, Col. 3, lines 24-45), wherein the frame buffer is a single memory for containing data of a plurality of subpixels corresponding to a pixel of the virtual frame buffer (rasterizing input pixel data as virtual pixels into a memory with a virtual resolution that is higher than the physically display pixel resolution, Col. 1, line 66-Col. 2, line 4; image is being rasterized in subpixels smaller than the display pixels, therewith achieving a higher resolution than the display resolution, Col. 1, lines 46-50); and accessing data of a subpixel at the at least one physical address within the frame buffer (the system linearly combines per each colour component the existing and the input colour value and by using the result thereof to overwrite the existing colour value of the physical pixel at the memory location of the physical pixel, Col. 2, lines 10-14).*

However, van Vugt does not teach determining if the memory address is within a virtual frame buffer and, if so, performing the transforming and accessing. However, Porterfield describes that if the address falls within the virtual frame buffer range (GART range 184, Figure 3; Col. 4, lines 35-45), the address is transformed (Col. 7, lines 15-17).

It would have been obvious to one of ordinary skill in this art at the time of invention by applicant to modify the device of van Vugt to include determining if the memory address is within a virtual frame buffer and, if so, performing the transforming and accessing as suggested by Porterfield. Porterfield suggests that a computer system (150, Figure 3) typically uses different ranges of address space (180) for different devices and system agents. Therefore, it would be advantageous for only the addresses falling within the virtual frame buffer range to be transformed, and all addresses not in the virtual frame buffer range are passed through without

modification so that they map directly to the main memory range (186) or to device specific ranges (Col. 7, lines 10-21).

17. With regard to Claim 2, van Vugt does not teach accessing data at the memory address provided the memory address is not within the virtual frame buffer. However, Porterfield describes that if the address is not in the virtual frame buffer range (GART range 184, Figure 3; Col. 4, lines 35-45), the address is accessed at the main memory range (186) (Col. 7, lines 18-21). This would be obvious for the same reasons given in the rejection for Claim 1.

18. With regard to Claim 3, van Vugt does not teach describes that the virtual frame buffer comprises a predefined memory range of a graphics memory. However, Porterfield describes that the virtual frame buffer comprises a predefined memory range of a graphics memory (GART range 184, Figure 3; Col. 4, lines 25-45; Col. 7, lines 10-21). This would be obvious for the same reasons given in the rejection for Claim 1.

19. With regard to Claim 4, van Vugt describes that the memory address is received from a central processing unit (CPU) (15, 16, Figure 2; *processor unit 15 sends requests for modification of these pixels to the 'put pixel' module 16*, Col. 4, lines 27-30; *when a double-resolution virtual pixel is transferred to, the put pixel module 16, the address of the memory location containing the corresponding normal-resolution physical pixel is being calculated therein*, Col. 4, line 66-Col. 5, line 2).

20. With regard to Claim 9, Claim 9 is similar to Claim 1, except that Claim 9 is for accessing data in order to read data. Van Vugt describes accessing data in order to read data (Col. 2, lines 4-14). Therefore, Claim 9 is rejected under the same rationale as Claim 1.

21. With regard to Claim 10, van Vugt describes providing the subpixel value to a central processing unit (CPU) (15, Figure 2) (Col. 1, lines 46-54; Col. 4, lines 20-33).

22. With regard to Claim 13, Claim 13 is similar in scope to Claim 3, and therefore is rejected under the same rationale.

23. With regard to Claim 15, Claim 15 is similar in scope to Claim 9, except Claim 15 is for reading the plurality of subpixel values and combining the subpixel values. Van Vugt describes reading the plurality of subpixel values at the plurality of physical addresses within the frame buffer and combining the subpixel values to generate a pixel value for the specific pixel *(rasterizing input pixel data as virtual pixels into a memory with a virtual resolution that is higher than the physically displayed pixel resolution, retrieving from the memory an existing colour value of the physical pixel that corresponds to a virtual pixel, the system linearly combines per each colour component the existing and the input colour value and by using the result thereof to overwrite the existing colour value of the physical pixel at the memory location of the physical pixel, Col. 1, line 66-Col. 2, line 14; image is being rasterized insubpixels smaller than the display pixels, therewith achieving a higher resolution than the display resolution, Col. 1, lines 46-50)*. Therefore, Claim 15 is rejected under the same rationale as Claim 9.

24. With regard to Claim 16, van Vugt describes providing the pixel value to a central processing unit (CPU) (15, Figure 2; Col. 4, lines 20-33).

25. With regard to Claim 17, van Vugt describes that the combining comprises blending the subpixel values into a single color value (Col. 1, lines 50-54).

26. With regard to Claim 19, Claim 19 is similar in scope to Claim 3, and therefore is rejected under the same rationale.

27. With regard to Claim 21, Claim 21 is similar to Claim 1, except that Claim 21 is for accessing data in order to write data. Van Vugt describes accessing data in order to write data (Col. 2, lines 4-14). Therefore, Claim 21 is rejected under the same rationale as Claim 1.

28. With regard to Claim 22, Claim 22 is similar in scope to Claim 2, and therefore is rejected under the same rationale.

29. With regard to Claim 24, van Vugt does not teach that a base address of the predefined memory range is different from a base address of the frame buffer. However, Porterfield describes that a base address of the predefined memory range is different from a base address of the frame buffer (Col. 4, lines 35-45; Col. 9, lines 16-20).

It would have been obvious to one of ordinary skill in this art at the time of invention by applicant to modify the device of van Vugt so that a base address of the predefined memory range is different from a base address of the frame buffer as suggested by Porterfield because Porterfield suggests that a computer system (150, Figure 3) typically uses different ranges of address space (180) for different devices and system agents. Since the predefined memory range (184, Col. 4, lines 35-45) is different from the frame buffer range, they must have different base addresses (Col. 7, lines 10-21).

30. With regard to Claim 26, Claim 26 is similar in scope to Claim 3, and therefore is rejected under the same rationale.

31. With regard to Claim 33, van Vugt does not teach that the computer program is an operating system. However, Porterfield describes that the computer program is an operating system (Col. 8, lines 45-52).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify the device of van Vugt so that the computer program is an operating system as suggested by Porterfield because Porterfield suggests that it is well-known in the art to use operating system software to perform operations on memory (Col. 3, lines 44-48).

32. With regard to Claim 34, van Vugt does not teach that the computer program is a software driver. However, Porterfield describes that the computer program is a software driver (Col. 7, lines 24-31).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify the device of van Vugt so that the computer program is a software driver as suggested by Porterfield because Porterfield suggests that a software driver is needed in order to define the address translation in software, therefore advantageously providing the substantial implementation flexibility needed to address future partitioning and remapping circuitry as well as any current or future compatibility issues (Col. 7, lines 24-31).

33. Claims 5, 6, 11, 12, 18, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over van Vugt (US006833835B1) and Porterfield (US006249853B1) in view of Dye (US005664162A).

34. With regard to Claim 5, van Vugt and Porterfield are relied upon for the teachings as discussed above relative to Claim 4.

However, van Vugt and Porterfield do not teach providing the CPU with a pitch value of the frame buffer. However, Dye describes providing the CPU (128, Figure 1) with a pitch value of the frame buffer (110) (*CPU 128 controls the system bus 102 for providing data and instructions, host CPU 128 asserts address signals*, Col. 7, lines 59-66; *host data bus transfers data and instructions to and from the host computer system, which includes the host CPU 128*, Col. 9, lines 59-64; *pitch of the frame buffer 110*, Col. 12, lines 10-17).

It would have been obvious to one of ordinary skill in this art at the time of invention by applicant to modify the devices of van Vugt and Porterfield to include providing the CPU with a pitch value of the frame buffer as suggested by Dye because Dye suggests that the CPU needs to

know the pitch value of the frame buffer in order to read data from the correct location corresponding with the virtual frame buffer (116) (Col. 3, lines 49-51; Col. 12, lines 1-24).

35. With regard to Claim 6, van Vugt and Porterfield do not teach the CPU calculating a physical address within the frame buffer using the pitch value of the frame buffer as the pitch of the virtual frame buffer. However, Dye describes the CPU (128, Figure 1) calculating a physical address within the frame buffer (110) using the pitch value of the frame buffer as the pitch of the virtual frame buffer (116) (*private memory is virtual frame buffer*, Col. 3, lines 49-51; Col. 12, lines 1-24). This would be obvious for the same reasons given in the rejection for Claim 5.

36. With regard to Claim 11, Claim 11 is similar in scope to Claim 5, and therefore is rejected under the same rationale.

37. With regard to Claim 12, Claim 12 is similar in scope to Claim 6, and therefore is rejected under the same rationale.

38. With regard to Claim 18, Claim 18 is similar in scope to Claim 6, and therefore is rejected under the same rationale.

39. With regard to Claim 25, Claim 25 is similar in scope to Claim 18, and therefore is rejected under the same rationale.

40. Claims 7, 8, 14, 20, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over van Vugt (US006833835B1) and Porterfield (US006249853B1) in view of Baldwin (US005594854A).

41. With regard to Claim 7, van Vugt and Porterfield are relied upon for the teachings as discussed above relative to Claim 1.

However, van Vugt and Porterfield do not teach that the plurality of subpixels corresponding to the pixel of the virtual frame buffer have physical addresses that are nearby each other. However, Baldwin describes that the buffer must reside at contiguous physical addresses, and if the virtual memory buffer maps to non-contiguous physical memory, then the buffer must be divided into sets of contiguous physical memory pages (Col. 18, lines 45-52). Therefore, the plurality of subpixels (Col. 34, lines 61-67) corresponding to the pixel of the virtual frame buffer have physical addresses are nearby each other (Col. 18, lines 35-52).

It would have been obvious to one of ordinary skill in this art at the time of invention by applicant to modify the devices of van Vugt and Porterfield so that the plurality of subpixels corresponding to the pixel of the virtual frame buffer have physical addresses that are nearby each other as suggested by Baldwin because Baldwin suggests that this is needed because the data in the physical memory needs to be transferred together (Col. 18, lines 35-52).

42. With regard to Claim 8, van Vugt describes that the physical addresses are also based on a base physical address which corresponds to the memory address (*memory address within a*



*given frame-buffer of the physical pixel corresponding to the reference pixel is calculated, parameters in the calculation include the frame-buffer start address, Col. 3, lines 28-40).*

43. With regard to Claim 14, Claim 14 is similar in scope to Claim 8, and therefore is rejected under the same rationale.

44. With regard to Claim 20, Claim 20 is similar in scope to Claim 14, and therefore is rejected under the same rationale.

45. With regard to Claim 27, Claim 27 is similar in scope to Claim 20, and therefore is rejected under the same rationale.

46. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over van Vugt (US006833835B1) and Porterfield (US006249853B1) in view of Priem (US005623692A).

van Vugt and Porterfield are relied upon for the teachings as discussed above relative to Claim 21.

However, van Vugt and Porterfield do not teach that a base address of the predefined memory range is the same as a base address of the frame buffer. However, Priem describes that a base address of the predefined memory range is the same as a base address of the frame buffer (*generate physical addresses starting from the virtual start address, Col. 27, lines 24-29*).

It would have been obvious to one of ordinary skill in this art at the time of invention by applicant to modify the devices of van Vugt and Porterfield so that a base address of the

predefined memory range is the same as a base address of the frame buffer as suggested by Priem because Priem suggests that in the case where an application program transfers commands requesting DMA operations directly to the input/out control unit 29 without operating system intervention, the application program has no knowledge of the physical addresses involved, so the base address of the predefined memory range is set to be the same as the base address of the frame buffer (Col. 27, lines 12-29).

47. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over van Vugt (US006833835B1) in view of Priem (US005623692A).

Claim 36 is similar in scope to Claim 23, and therefore is rejected under the same rationale.

48. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over van Vugt (US006833835B1) and Priem (US005623692A) in view of Dye (US005664162A).

Van Vugt and Priem are relied upon for the teachings as discussed above relative to Claim 36. Priem describes that the base address of the virtual frame buffer is the same as a base address of the frame buffer, as discussed in the rejection for Claim 23.

However, van Vugt and Priem do not teach supplying a pitch to the computer program, the pitch corresponding to the virtual frame buffer and being equal to a pitch of the frame buffer. However, Dye describes supplying a pitch to the computer program, the pitch corresponding to the virtual frame buffer and being equal to a pitch of the frame buffer (Col. 12, lines 1-24). This would be obvious for the same reasons given in the rejection for Claim 5.

49. Claims 38-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over van Vugt (US006833835B1) in view of Baldwin (US005594854A).

50. With regard to Claim 38, Claim 38 is similar in scope to Claim 7, and therefore is rejected under the same rationale.

51. With regard to Claim 39, Claim 39 is similar in scope to Claim 32 except that Claim 39 is for writing the pixel value and the plurality of subpixels comprise nearby physical addresses.

Van Vugt describes writing the pixel value (Col. 2, lines 10-14).

However, van Vugt does not teach that the plurality of subpixels comprise nearby physical addresses. However, Baldwin describes that the buffer must reside at contiguous physical addresses, and if the virtual memory buffer maps to non-contiguous physical memory, then the buffer must be divided into sets of contiguous physical memory pages (Col. 18, lines 45-52). Therefore, the plurality of subpixels (Col. 34, lines 61-67) corresponding to the pixel of the virtual frame buffer have physical addresses are nearby each other (Col. 18, lines 35-52), as discussed in the rejection for Claim 7.

52. With regard to Claim 40, van Vugt does not teach that the computer program is an operating system. However, Baldwin describes that the computer program is an operating system (Col. 4, lines 40-44). This would be obvious for the same reasons given in the rejection for Claim 33.

53. With regard to Claim 41, van Vugt does not teach that the computer program is a software driver. However, Baldwin describes that the computer program is a software driver (Col. 26, lines 11-13). This would be obvious for the same reasons given in the rejection for Claim 34.

54. With regard to Claim 42, Claim 42 is similar in scope to Claim 35, and therefore is rejected under the same rationale.

55. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over van Vugt (US006833835B1) and Baldwin (US005594854A) in view of Priem (US005623692A).

Claim 43 is similar in scope to Claim 23, and therefore is rejected under the same rationale.

56. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over van Vugt (US006833835B1) and Baldwin (US005594854A) and Priem (US005623692A) in view of Dye (US005664162A).

Claim 44 is similar in scope to Claim 37, and therefore is rejected under the same rationale.


*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joni Hsu whose telephone number is 571-272-7785. The examiner can normally be reached on M-F 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on 571-272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JH



**Kee M. Tung**  
Primary Examiner